(12) UK Patent Application (19) GB (11) 2 219 658 (13) A

(43) Date of A publication 13.12.1989

(21) Application No 8813816.9

(22) Date of filing 10.06.1988

(51) INT CL⁴
G01S 3/80

(52) UK CL (Edition J)
G1G GRC
U1S S1865

(56) Documents cited
None

(58) Field of search
UK CL (Edition J) G1G GER GEV GRA GRC
INT CL⁴ G01S

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# (54) Escape guidance apparatus having headphones, an ultrasonic transmitter and a frequency shifting circuit

(57) For the guidance of occupants of an aircraft, or any other enclosure, to an exit in the case of fire or other emergency, a transmitter is provided near the exit to emit signals beyond human audibility, and the occupants wear headphones converting the signals into audible tones. It is arranged that the tone heard when facing the exit differs from that heard when facing any other direction.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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# Escape Guidance Apparatus

The invention relates to escape guidance apparatus and primarily but not exclusively to apparatus for the guidance of passengers when it is necessary to escape, primarily from an aircraft, though the invention may also be of use in guiding passengers from other craft or vehicle or even from a building or enclosure.

It is an unfortunate fact that in an emergency situation such as exemplified by a fire, many people become readily disoriented, and the disorientation is severely compounded if the emergency is combined with the emission of smoke or the loss of illumination, and even those people who accurately remember the route to a place of relative safety find it difficult to find their way to that place.

In aircraft it is known for each passenger to be provided with a smoke hood, normally stowed above his head but capable of being released in a fire emergency, and the invention seeks to employ such hoods, when available, or other means, for directing persons to a place of safety.

According to my invention, I provide apparatus for the guidance of persons to a place of safety comprising a transmitter capable of transmitting a signal at a frequency beyond the range of audibility to the human ear and guiding means comprising means for receiving the tone emitted from the transmitter and converting it into audible tones of at least two distinct types depending on the angular relationship between the guiding means and the transmitter, the tones enabling the person having the guiding means to distinguish between angles leading towards the transmitter and

those deviating from such direction by more than a predetermined value.

Preferably the guiding means comprises a pair of headphones and the receiving means are such that a person wearing the headphones will hear an audible tone of one quality when facing the transmitter or in a direction in a small angle at either side of that direction whilst he will receive a different audible signal when facing in any other direction.

The receiving means are preferably battery operated, and the head phones are preferably contained within disposable smoke hoods.

Embodiments of the invention will now be described by way of example in order more fully to explain the concept.

In a first an preferred embodiment, the transmitter is located in close proximity to an exit from an aircraft, whilst each of the passengers has a battery operated headphone unit embodied, for convenience, in a smoke hood or mask.

The transmitting unit constantly emits a steady tone to frequency beyond audibility by the normal human ear. Each headphone unit contains a directional receiver for each side of the head capable of responding to the tone emitted by the transmitter and producing signals capable of conversion into sounds audible to the passenger. The receivers have a narrow receiving capability, such that when the wearer of the headphones is directly facing the transmitter he receives a steady tone but if he turns to one side or the other by more than a predetermined degree he will hear a broken tone. Thus whenever the passenger wearing the headphones

moves he will know whether he is moving at least approximately in the direction of the transmitter, by virtue of the sounds he is receiving even if he cannot see his way towards the exit.

By a suitable choice of directional property in the receiver, the width of path "leading" to the exit may be determined as required.

The apparatus is capable of other variation, for example electric circuitry may be incorporated to provide that the tones received respectively within and outside the predetermined range based on the direction of the transmitter shall be other than aforementioned, and it may be possible to provide tones different as to whether they are to one side or the other of the central path.

In order to ensure that deviation in the vertical plane is not confused with deviation in the horizontal plane, a series of transmitters may be provided to provide signals giving constant emission from floor to ceiling of the aircraft so that the same directional indications can be given to passengers according to whether circumstances of the emergency permit them to walk or require them to crawl.

Whilst it may be advantageous for the headphones to be incorporated in smoke hoods, this is not essential, and indeed apparatus according to the invention may be used in situations where smoke hoods are not, or are not normally, provided.

It appears that the invention may have some application in indicating a means of escape from other emergency situations such as from ships, vehicles, buildings or enclosur s, the proviso being that the transmitting

unit shall be positioned adjacent a place of relative safety such as an exit, and that each of the occupants shall have headphones which can be placed in position if an emergency arises.

CLAIMS

1. Apparatus for the guidance of a person to a place of safety comprising a transmitter for location at a position spatially related to said place of safety, and capable of transmitting a signal at a frequency beyond the range of audibility to the human ear and guiding means comprising means capable of being carried by said person and for receiving the signal emitted from the transmitter and converting it into audible tones of at least two distinct types depending on the angular relationship between the guiding means and the transmitter, the tones enabling the person carrying the guiding means to distinguish between angles leading towards the transmitter and those deviating from such direction by more than a predetermined value.

2. Apparatus according to Claim 1, wherein the guiding means comprise a pair of headphones and the receiving means are such that a person wearing the headphones will hear an audible tone of one quality when facing the transmitter or in a direction in a small angle at either side of that direction whilst he will receive a different audible signal when facing in any other direction.

3. Apparatus according to Claim 2, wherein the head phones are contained within disposable smoke hoods.

4. Apparatus according to Claim 1, 2 or 3, wherein receiving means are battery operated.

5. Apparatus for the guidance of a person to a place of safety substantially as described.

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